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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/034,767 | 12/28/2001 | Norman Binger | 2001-034-NSC | 1162 |

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EXAMINER

BONURA, TIMOTHY M

ART UNIT PAPER NUMBER

2114

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/034,767

Applicant(s)

BINGER, NORMAN

Examiner

Tim Bonura

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-24 and 32 is/are allowed.
- 6) ☒ Claim(s) 1-3, 9-12 and 25-27 is/are rejected.
- 7) ☒ Claim(s) 4-8, 13-19 and 28-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____


NADEEM IQBAL
PRIMARY EXAMINER

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 9-12, and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sicola, et al, U.S. Patent Number 6,658,590 and further in view of Rust, et al, U.S. Patent Number 6,647,516.

3. Regarding claim 1:

a. Regarding the limitation of “a computing device accessing virtual storage,” Sicola discloses a system with a computer system accessing a data storage array with redundant controllers. (Lines 38-43 of Column 3).

b. Regarding the limitation of “a plurality of physical storage devices,” Sicola discloses a system with a computer system accessing a data storage array with redundant controllers. (Lines 38-43 of Column 3).

c. Regarding the limitation of “a controller in communication with the computing device and the plurality of physical storage, the controller operative to receive a virtual storage access request from the computing device specifying a virtual data access, the

virtual data access comprising a plurality of blocks, each of the plurality of blocks associated with one of at least two target physical storage devices, the target physical storage devices comprising at least a subset of the plurality of physical storage devices,” Sicola discloses a system with logical units (LUNs) which consist of a storage array of physical drives. (Lines 58-60 of Column 3 and Lines 51-59 of Column 6 and Lines 15-20 of Column 7). Data can be written to the plurality of drives. (Lines 21-22 of Column 6).

d. Regarding the limitation of “determine an access sequence associating one target storage device with each block in the received virtual storage access request,” Sicola discloses a system that has control accessing across the LUNs, given a request by the system to access a storage array. (Lines 12-19 of Column 8).

e. Regarding the limitation of “send at least one physical access request to each target storage device,” Sicola discloses a system with data that can be written to the plurality of drives. (Lines 21-22 of Column 6).

f. Regarding the limitation of “receive at least one error message from at least one target storage device, each error message having an error type,” Sicola discloses a RAID system with a heartbeat monitor to detect errors. (Lines 44-52 of Column 4). Sicola does not disclose a system that can generate or receive an error type. However, Rust a RAID system that has an analysis circuitry to identify error types within a RAID storage system based upon error conditions that are received. (Lines 38-55 of Column 5). One of ordinary skill in the art at the time of the invention would have been motivated to combine the storage array system of Sicola with the error analysis RAID system of Rust.

One would have been motivated because Sicola states that need for system continuation during times of failure. (Lines 40-45 of Column 7). Rust fulfills this system need by preventing error condition being replicated beyond the originating device. (Line 25-28 of Column 6).

g. Regarding the limitation of “determine an error response based on the error message type and on the access sequence,” Rust discloses a system that can isolate a device given and error certain type of error conditions. (Lines 45-49 of Column 6).

4. Regarding claim 2, Sicola discloses a system that can have communications errors. (Lines 54-56 of Column 4). Rust discloses a system with parity and protocol errors. (Lines 38-40 of Column 5).

5. Regarding claim 3, Sicola discloses controller fail over to a redundant storage array upon failure detection. (Lines 54-56 of Column 4).

6. Regarding claim 9, Rust discloses a system with parity validation that can detect error conditions within transaction of data being processed. (Lines 26-33 of Column 5).

7. Regarding claim 10:

h. Regarding the limitation of “determining an access sequence associating one target storage device with each block in the virtual storage request,” Sicola discloses a system that has control accessing across the LUNs, given a request by the system to access a storage array. (Lines 12-19 of Column 8).

i. Regarding the limitation of “sending at least one physical access request to each target storage device,” Sicola discloses a system with data that can be written to the plurality of drives. (Lines 21-22 of Column 6).

- j. Regarding the limitation of “receive at least one error message from at least one target storage device, each error message having an error type,” Sicola discloses a RAID system with a heartbeat monitor to detect errors. (Lines 44-52 of Column 4). Sicola does not disclose a system that can generate or receive an error type. However, Rust a RAID system that has an analysis circuitry to identify error types within a RAID storage system based upon error conditions that are received. (Lines 38-55 of Column 5). One of ordinary skill in the art at the time of the invention would have been motivated to combine the storage array system of Sicola with the error analysis RAID system of Rust. One would have been motivated because Sicola states that need for system continuation during times of failure. (Lines 40-45 of Column 7). Rust fulfills this system need by preventing error condition being replicated beyond the originating device. (Line 25-28 of Column 6).
- k. Regarding the limitation of “determining an error response based on the error type for at least one error message and on the access sequence,” Rust discloses a system that can isolate a device given and error certain type of error conditions. (Lines 45-49 of Column 6).
8. Regarding claim 11, Sicola discloses a system that can have communications errors. (Lines 54-56 of Column 4). Rust discloses a system with parity and protocol errors. (Lines 38-40 of Column 5).
9. Regarding claim 12, Sicola discloses controller fail over to a redundant storage array upon failure detection. (Lines 54-56 of Column 4).
10. Regarding claim 25:

l. Regarding the limitation of “a plurality of physical storage devices, each physical storage device storing information as a plurality of blocks, each physical storage device responding to a failed physical access request,” Sicola discloses a system with a computer system accessing a data storage array with redundant controllers. (Lines 38-43 of Column 3). Sicola discloses controller fail over to a redundant storage array upon failure detection. (Lines 54-56 of Column 4).

m. Regarding the limitation of “determine an access sequence associating one target storage device with each block in the received virtual storage request,” Sicola discloses a system that has control accessing across the LUNs, given a request by the system to access a storage array. (Lines 12-19 of Column 8).

n. Regarding the limitation of “send at least one physical access request to each physical storage device listed in the access sequence,” Sicola discloses a system with data that can be written to the plurality of drives. (Lines 21-22 of Column 6).

o. Regarding the limitation of “receive at least one error message from at least one target storage device, each error message having an error type,” Sicola discloses a RAID system with a heartbeat monitor to detect errors. (Lines 44-52 of Column 4). Sicola does not disclose a system that can generate or receive an error type. However, Rust a RAID system that has an analysis circuitry to identify error types within a RAID storage system based upon error conditions that are received. (Lines 38-55 of Column 5). One of ordinary skill in the art at the time of the invention would have been motivated to combine the storage array system of Sicola with the error analysis RAID system of Rust. One would have been motivated because Sicola states that need for system continuation

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during times of failure. (Lines 40-45 of Column 7). Rust fulfills this system need by preventing error condition being replicated beyond the originating device. (Line 25-28 of Column 6).

p. Regarding the limitation of “determine an error response based on the error message type and on the access sequence,” Rust discloses a system that can isolate a device given and error certain type of error conditions. (Lines 45-49 of Column 6).

q. Regarding the limitation of “an error message having one of a plurality of error types,” Rust discloses a system wherein an error condition can have multiple causes. (Lines 38-40 of Column 5).

11. Regarding claim 26, Sicola discloses a system that can have communications errors. (Lines 54-56 of Column 4). Rust discloses a system with parity and protocol errors. (Lines 38-40 of Column 5).

12. Regarding claim 27, Sicola discloses controller fail over to a redundant storage array upon failure detection. (Lines 54-56 of Column 4)

Allowable Subject Matter

13. Claim 20-24 and 32 are allowed.

14. The following is an examiner’s statement of reasons for allowance:

15. Regarding claims 20-24 and 32, the prior art of record fails to teach canceling all active physical storage request later in the logical sequence then the problematic block.

16. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

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fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

17. Claims and 4-8, 13-19, and 28-31 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach canceling all active physical storage request later in the logical sequence than the problematic block.

Response to Arguments

19. Applicant's arguments filed 04/20/2005 have been fully considered but they are not persuasive.

20. Regarding the arguments for claims 1, 10, and 25:

r. Regarding the argument of "the examiner makes no attempt to find any teaching or suggestion in either, Rust or Sicola, for determining an error response based on the access sequence. The examiner contends that Sicola and Rust discloses a system with means for determining an error response based on access sequence. Sicola, (as cited above) teaches determining an access sequence associated with a storage device. (Lines 12-19 of Column 8). Rust teaches determining an error response based on error type. (Lines 45-49 of Column 6). And the examiner contends that Sicola discloses a system wherein the access sequence is used to determine an error response based upon the operational condition of the link. (Lines 63-67 of Column 7 and Lines 1-6 of Column 8). Sicola discloses this feature when it is stated "the configuration of [the] system allows for

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applications using either of the storage arrays to continue running given any failure.”

(Lines 16-18 of Column 8).

21. Regarding the argument about the title of the invention not being descriptive enough.

The examiner will give the applicant the courtesy opportunity to change the title to a more descriptive version. If the applicant wishes to not change the title, and the application becomes in condition for allowance for all other issue except the title objection, the examiner will change the title to a more descriptive title at the time of allowance.

Conclusion

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Tim Bonura**.

- The examiner can normally be reached on **Mon-Fri: 8:30-5:00**.
- The examiner can be reached at: **571-272-3654**.

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24. If attempts to reach the examiner by telephone are unsuccessful, please contact the examiner's supervisor, **Rob Beausoliel**.

- The supervisor can be reached on **571-272-3645**.

25. The fax phone numbers for the organization where this application or proceeding is assigned are:

- **703-872-9306 for all patent related correspondence by FAX.**

26. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov/>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

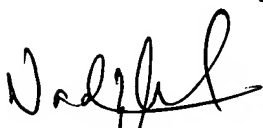
27. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the **receptionist** whose telephone number is: **571-272-2100**.

28. Responses should be mailed to:

- **Commissioner of Patents and Trademarks**

P.O. Box 1450

Alexandria, VA 22313-1450



**NADEEM IQBAL
PRIMARY EXAMINER**

tmb

July 11, 2005

Tim Bonura
Examiner
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